

## AGROFORESTRY SYSTEMS



Credit Photo : AGROOF



Camille Béral

# AGROOF SCOP

Created in 2000, AGROOF is a worker cooperative, specialized in agroforestry development

## RESEARCH

Multidisciplinary scientists network / Research programs / Network of experimental plots

## AUDIOVISUAL

Web tools / Interactive maps / Exchange platforms / Videos / Webdocumentaries

## TRAINING

For students and professionnals

## DEVELOPMENT

BASE Agroforesterie / Territorial development / network of farmer's plots



# AGROFORESTRY ?

**Short definition !**

**>>> Mixing trees with crops or animals on the same field.**

It is a generic term for different types of systems:

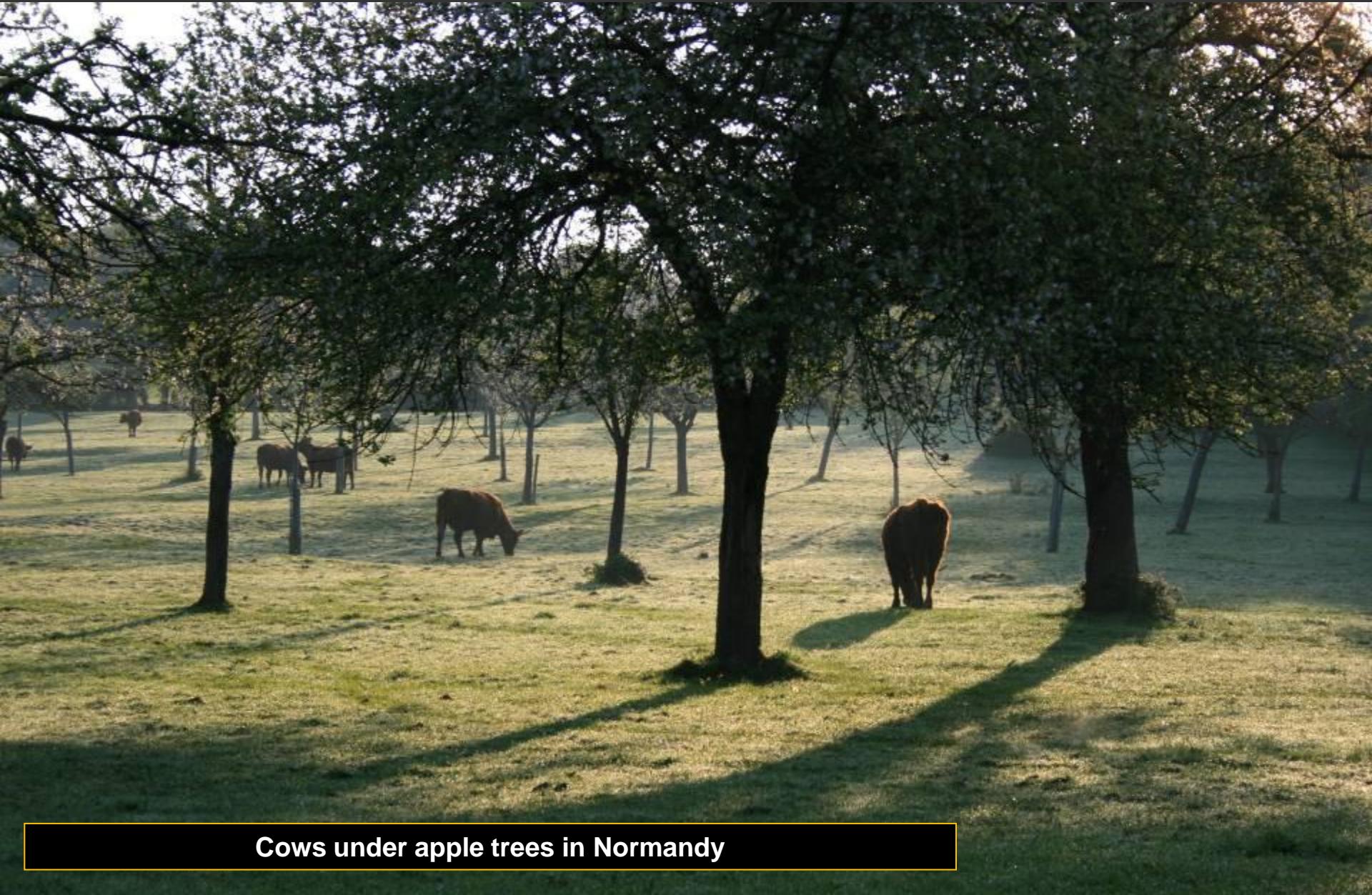
**sylvopastoral system and agrosylvicultural system**



# TRADITIONAL AFS



# GRAZING ORCHARDS



Cows under apple trees in Normandy

# INTERCROPPING IN WALNUT



Maize intercropping under Walnut in Dauphiné

# 60 years later...



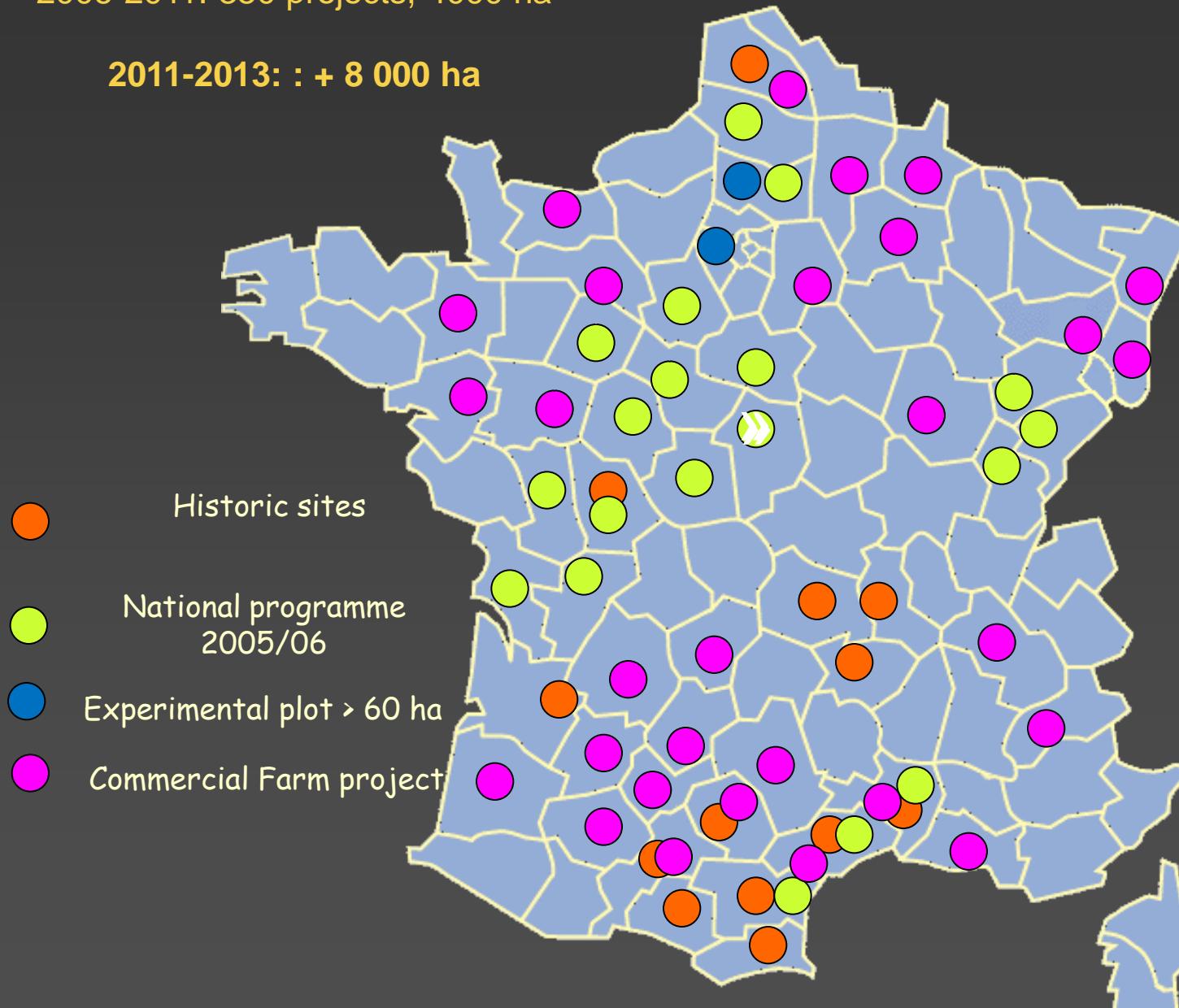
# MODERN AFS



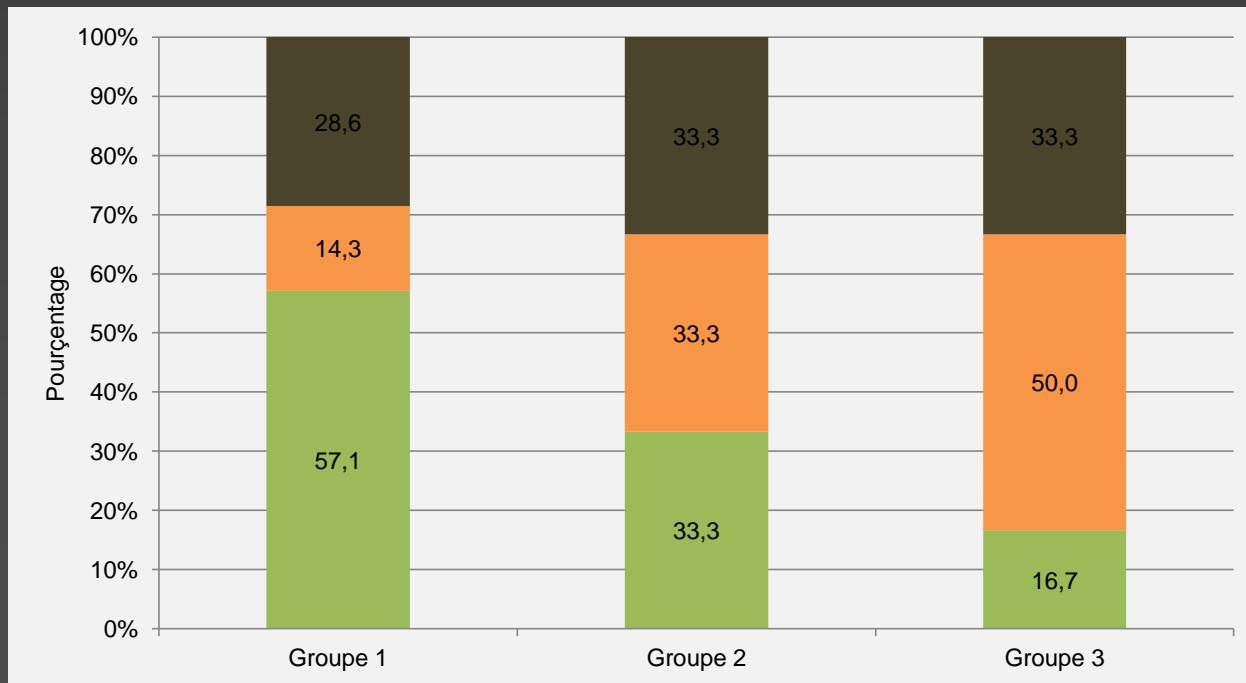
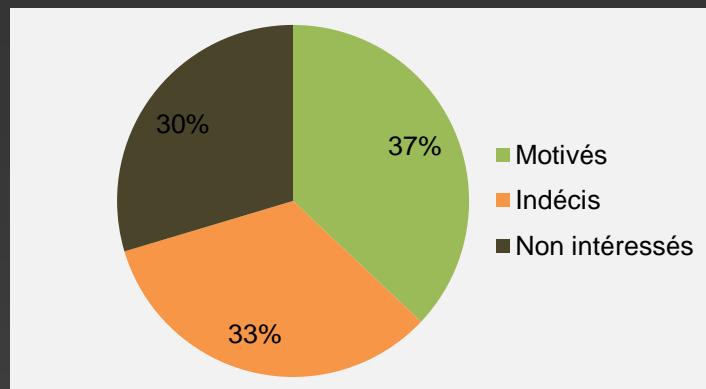
# Historic of modern AFS

2006-2011: 350 projects, 4000 ha

**2011-2013: : + 8 000 ha**



# Development dynamics in France



# Research in Temperate Agroforestry

A key result



30 to 60 % more  
biomass in AFS than in  
separated crop and  
woodland systems



# Production diversification



Timber



Chemistry



RCW



Mushrooms

Fruits



Firewood

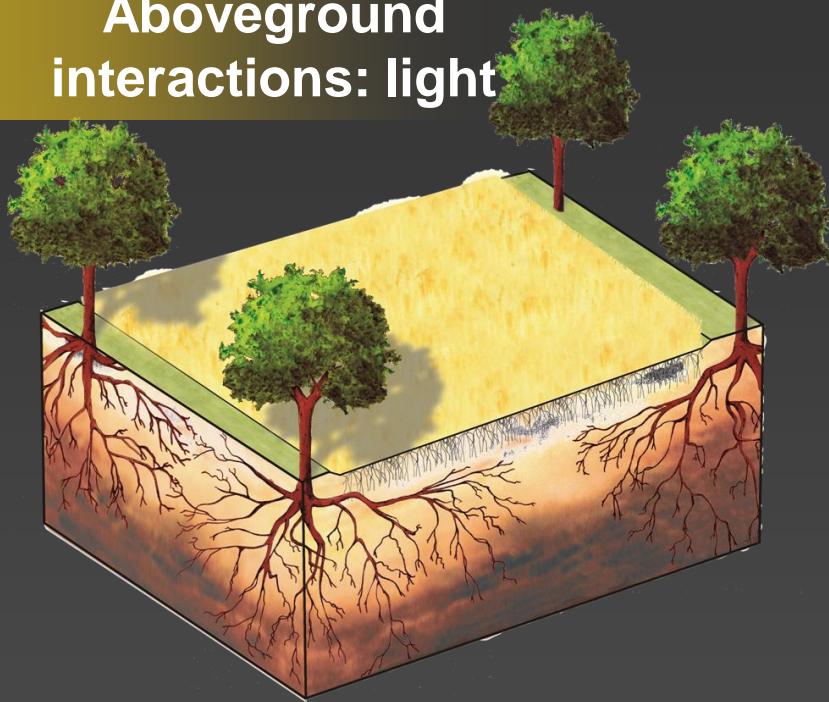


Biomaterials



# A win-win strategy ?

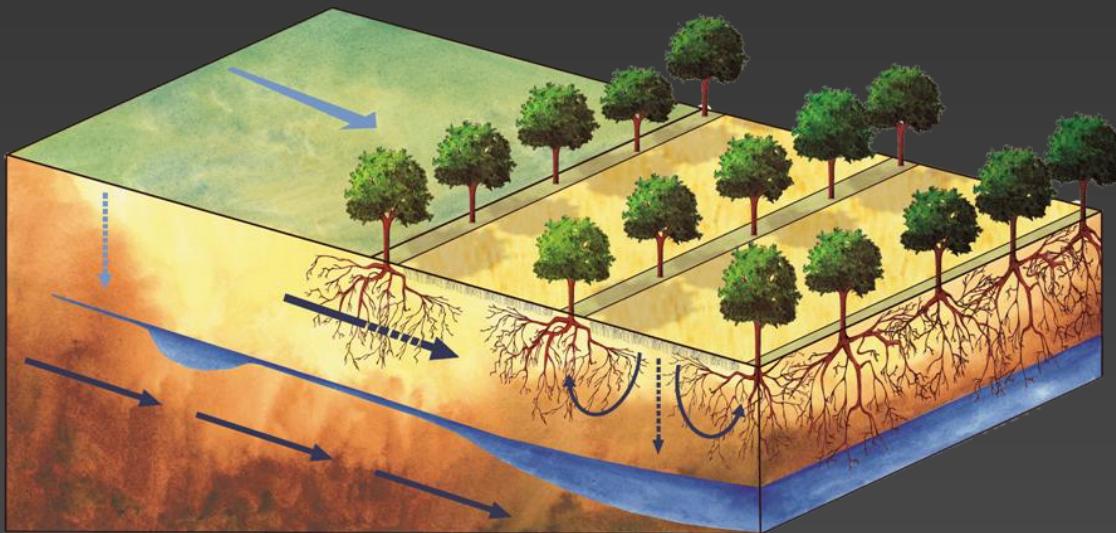
Aboveground  
interactions: light



Belowground  
interactions: water and  
nitrogen



# Impact on water quality

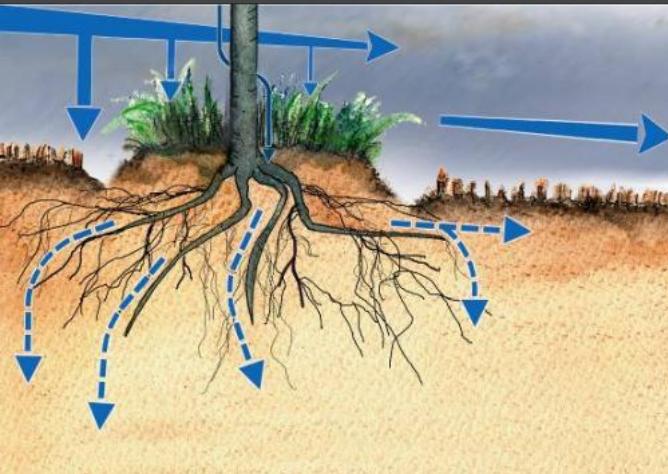


Water quality

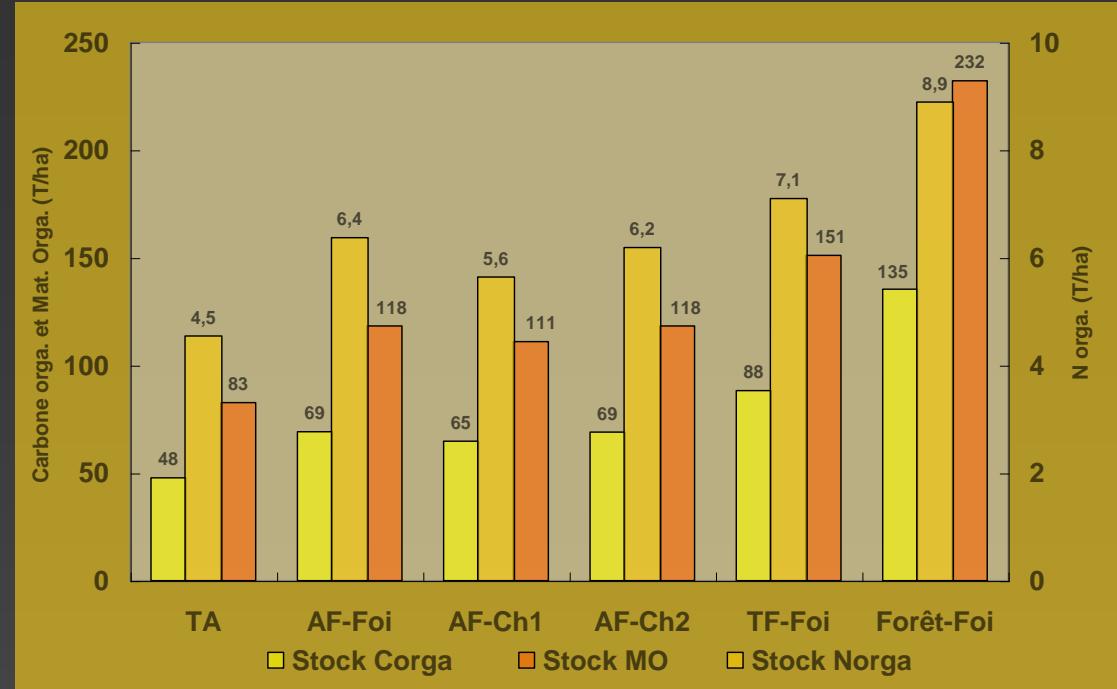
# Soil fertility and erosion



## Soil fertility



## Erosion



What is the spatial and temporal variability of OM input ? What's its dynamics linked to biological activity ? What impact on carbon storage into soil ? What impact on fertilization management ?

# Landscape



Credit : Chambre d'Agriculture de la Drôme

## Landscape

What amenity valuation ?

# Climate change



## Adaptation

What impact on crop yield ?  
Animal welfare ?



## Attenuation

How much carbon is stored into the soil ? What it's spatial and temporal dynamics linking to pedofauna ?

# Biodiversity conservation

Aboveground

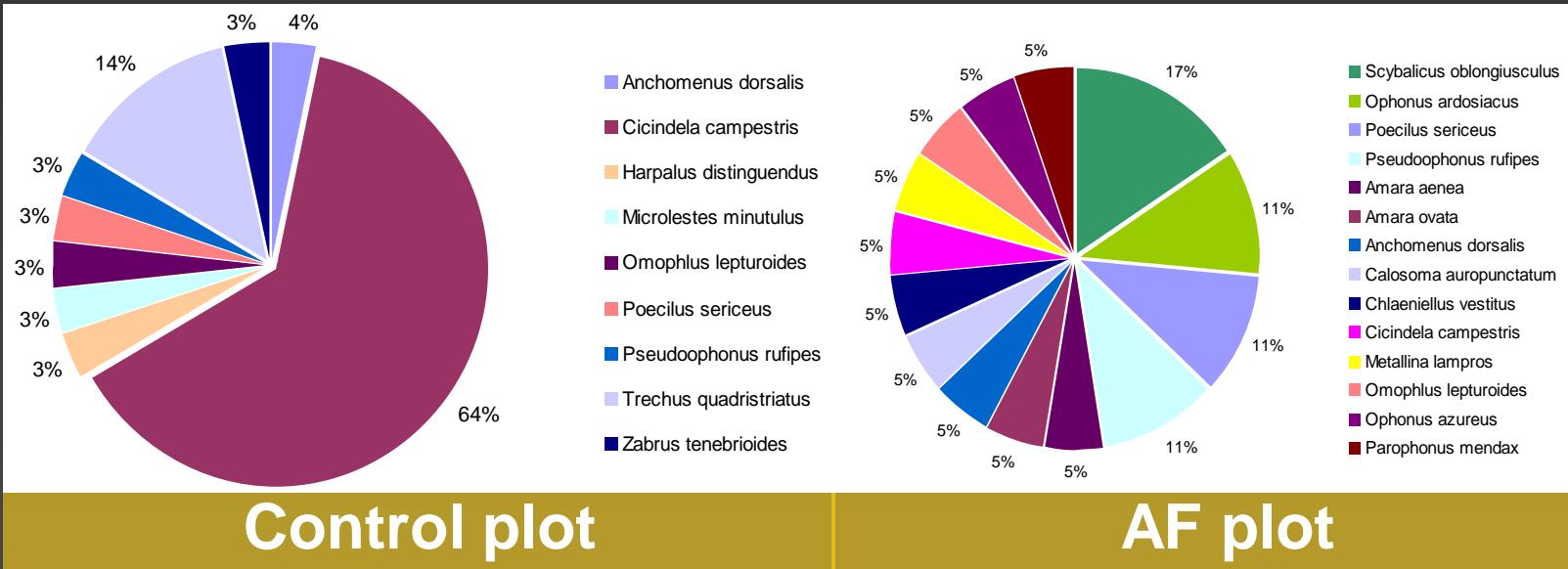


Surface

Belowground

# Biological control

## >>> Biological control by habitats conservation



### Main questions remained :

- 1 – Functional approach
- 2 – What impact on predation ?
- 3 – How trees impacts spatial and temporal dynamics ?

# CULTIVATED BIODIVERSITY



Varietal/Genetic selection – Adaptation to AFS conditions

Crop's and tree's varieties adapted to integrated agricultural production systems : What approach ?

# PARTICIPATORY APPROACH



Françoise Martin-Chave



Monitoring beneficial diversity – example of the first experiences

Why is it interesting ? How to build a participatory approach ? What strategy ?  
What tools ? ....